Document Type / Category	Instructions For Use (IFU)
Document Number, Issue, Title	IFU 001 Rev01 Cleaning, Preparation and Removal of Organic and Inorganic Debris from Heat Exchange Coils

1. PURPOSE

This Cleaning and Preparation Procedure outlines the process to effectively remove organic and inorganic debris from a Heat Exchange Coil. This provides 2 outcomes:

- A clean and efficient Heat Exchange Coil performing as designed.
- A coil prepared and ready for the application of AerisGUARD Coil Treatment which provides protection for up to 12 months. This ensures long-term efficiency, optimal system performance and operation, ensuring the system provides:
  - superior indoor air quality
  - maximised air flow
  - optimised heat exchange
  - reduced energy consumption

This IFU covers the steps and actions that need to be taken in the use of AerisGUARD Multi-Enzyme Coil Cleaner (Preparation) products.

All Aeris Environmental personnel, sub-contractors and Certified Applicators are expected to take an active role in establishing, implementing and maintaining this procedure in line with this IFU according to their role and responsibility.

The purpose of acting in accordance with this IFU is to have an uninterrupted, smooth process that ensures the correct process and use of the products are followed. This IFU shall also be part of Aeris' continuous improvement initiative.

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2. PROCEDURE DESCRIPTION AND PROCESS FLOW

The Clean & Preparation procedure is conducted by a Certified AerisGUARD Applicator in accordance with Aeris Environmental Recommendation, your work order and/or job specification. This Process should be followed by the application of AerisGUARD Coil Treatment as outlined in **IFU 002 - Application of AerisGUARD Coil Treatment.**

The steps in this procedure are as follows:

1. Preparation
    a. Product Handling & Packaging
    b. Apparatus & Equipment Required
    c. Product Dilution and Application Rates
    d. PPE and OH&S Requirements
2. Setup
3. Coil Clean / Prepare process
4. Clean up Process

3. PROCEDURE

1. Preparation

a. Product Handling & Packaging

- Applicators should consult the product Safety Data Sheet (SDS) prior to use and handling.
- AerisGUARD Multi-Enzyme Coil Cleaner (Preparation) product comes in a concentrate formulation and is used as required (20:1 Dilution ratio).
- The product is available in 200mL (6.76 fl oz) & 1L (0.26 US Gal) units.
- The concentrate has a shelf life of 3 years from the date of manufacture.
- Once diluted the solution is only effective for up to 24 hours.
- Always store the product out of direct sunlight and not exposed to hot environments for extended periods of time.

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b. Apparatus & Equipment Required

Wet & Dry Vacuum

Water pressure washer

Aeris Product applicator (4L (1.06 US Gal) pump spray with adjustable nozzle / use of larger applicator for large coils)

Tarpaulin/Plastic Sheeting

Occy-straps

Ladder

G-clamps

Power leads

Safety Over-ride Switch/Residual Current Device (RCD)

Thin rope

Extra hose and fittings

Broom, Mop and Bucket

c. Product Dilution and Application Rates

The AerisGUARD Multi-Enzyme Coil Cleaner (Preparation) is supplied in a concentrate form; the dilution is 20:1.

The product is to be diluted with tap water at a warm temperature for best results (30 – 60 °C/86 – 140 °F)).

Once diluted the product is effective for up to 24hrs; left over product should be discarded.

* 200 mL (6.76 fl oz) of product makes 4L (1.06 US Gal) of cleaning solution
* 1L (0.26 US Gal) of product makes 20L (5.28 US Gal) of cleaning solution

- The application rate of the cleaning / preparation solution is 3L/m² (9.42 fl oz/sq ft) of Coil face (based on 12 fins/inch and 100mm/3.94 inches depth) 1.5L of the cleaning solution should be used on each side of the 1m² (10.76 sq ft) coil face.

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d. PPE and OH&S Requirements

- Gloves *(hi density rubber are recommended)*
- P3 half or full face mask with filters rated for particulate
- safety goggles *(Wraparound Clear are recommended)*
- Disposable suit is recommended to keep clean.
- type 1 heavy duty safety boots should always be worn.

N.B. Other safety equipment may be required. OH&S requirements can vary geographically or by project nature.

2. Setup

a. Ensure that the unit is “off line / isolated from operation” prior to and during the entire cleaning (coil preparation) process. This must be done by an appropriately certified person and may require an arrangement with the engineering staff at the site if necessary.
b. Ensure that equipment is protected by a (RCD) Residual Current Device to protect the user from electrical shock.
c. Ensure Equipment being used is in good working order and that local requirements are met.
d. Remove filtration media to protect the air filters from any deposits of debris, cleaning solution, treatment solution or water. A tarpaulin or plastic sheeting may be used to cover these if required.

Note: Air filters are best disposed of and replaced when cleaning the air handling system to avoid dirtying the components cleaned downstream of the filters.

e. Other parts of the system may need to be covered as well, e.g. fan motor and sensors located near the area to be cleaned.
f. Do not place the hot water pressure cleaner under any smoke or fire detectors as they could be set off.
g. Ensure that the hoses for the pressure cleaner are all attached securely to avoid any excess water on the floor.
h. A Wet Vac should always be set up and ready to be used on all applications.
i. The use of door mats is advisable to stop any dirt being walked into other areas.
j. All traces of dirt must be removed before leaving site.

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3. Coil Clean / Prepare process

a. Remove visible dirt

The entire area around the coils, ducts, fan and any other area of the HVAC room showing any signs of dust build up must be vacuumed to a clean state.

- this process is very important to maximise cleaning / preparation results.
- save overall clean up time at the end of the job
- shows a higher level of professionalism.
- helps to protect drains from blockage
- a dust mask must be used on starting the pre-clean.

b. Application of AerisGUARD Multi-Enzyme Coil Cleaner (Preparation)

i) Ensure drain lines are not blocked.

- This can be achieved by flushing the drain lines first.

All personal safety equipment must be worn for the remainder of the procedure.

ii) Apply Multi-Enzyme Coil Cleaner (Preparation) solution

- To apply the cleaning solution, use pressure / pump spray equipment (4L Aeris Applicator Pump).

- It is important to use a jet setting on the tip to maximise penetration and minimise aerosols of the solution.

- P3 respirator must be worn for the entire application and cleaning process.

- Apply AerisGUARD Multi-Enzyme Coil Cleaner (Preparation) starting from the top of the coil, covering the entire surface of the coil paying special attention to any dirty areas. (Any excess diluted solution should be applied to the top of the coil as this will run down through the fins, maximising coverage and deep penetration).

- Wherever possible access and apply Cleaner (Preparation) TO BOTH SIDES of the coil as recommended to ensure best results.

- Leave AerisGUARD Multi-Enzyme Coil Cleaner (Preparation) in contact for at least 15- 20 minutes depending on level of organic and inorganic debris.

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- Each coil will need a different amount of cleaning solution depending on the level of organic and inorganic debris. As a guide approximately 3 litres (0.79 US Gal) of prepared solution per square meter of coil face should be used (1.5L/0.395 US Gal each side)

- The use of AerisGUARD Multi-Enzyme Coil Cleaner (Preparation) also frees organic debris lodged in the drain.
    - This could cause drain lines to become blocked. Periodic inspections during the entire process are highly recommended.
    - The Wet Vac or Pressure Cleaner must be used to clear the drain lines following the procedure before leaving the site.

iii) <u>Rinsing / Pressure Clean</u>

- After AerisGUARD Multi-Enzyme Coil Cleaner (Preparation) has penetrated the coil debris (been allowed to activate for up to 20 mins), the pressure cleaner is used to remove all the digested debris.
- It is important to understand that pressure cleaning coils may increase airborne Macromolecular Organic Dust (MOD) concentrations. Extreme care must be taken to ensure containment to the area being cleaned and treated.
    - Blanking duct entries etc. with sealed plastic sheeting will provide an effective barrier. This also ensures no moisture carry over into supply air duct insulation/attenuator.
- Wherever possible the pressure clean / rinsing should be started from the “air off” side or against the air flow.
- Pay particular attention to coil fins to avoid any damage such as folding.
- The following should be performed on both sides of the coil.
    - The pressure cleaner (if applicable) should be set at higher than 45°C (113 °F) for direct expansion refrigerant coils or no higher than 100 °C for chilled and hot water coils,
    - Hold the rinsing apparatus at an angle of 45° diagonally down the coil and keep at this angle while cleaning the face of the coils
        a. This allows dirt to be pushed down the coil and into the drain rather than be pushed into the middle of the coil.
    - Each coil should be cleaned from right to left and left to right at 45° angle so as the inner edge of the fin surface is cleaned.
    - For best results start from the bottom of the coil and work up 300 mm (11.8 inches) at a time.

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- Once the top of the coil is reached, flush coil from top to bottom.
- This should continue until all foaming has stopped.

Water exiting the coil should be free from particulate and discolouration. If it is not repeat the cleaning process.

4. Clean Up Process
   - Ensure that all equipment is cleaned, packed up and removed from the area.
   - Mop/Vac up all excess water and ensure work area is clean and tidy with no sign of being there / take care to remove plastic sheeting sealing ductwork if used
   - Leave the worksite as you found it
   - Remove and dispose of all empty product containers
   - Remove all rubbish you have taken on site

Recommended additional process

It is highly recommended that the cleaned and prepared coil be treated with AerisGUARD Coil Treatment as described in **IFU 002 Application of AerisGUARD Coil Treatment.** This product provides long term benefits:

- Prevention from re-accumulation
- Sustained and long-term coil efficiency
- Improved machine operational performance
- Superior indoor air quality
- 12-month Performance Warranty
- Annual reminder to maintain warranty

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